

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION FOR LETTERS PATENT

**Loading Status in a Hypermedia Browser Having a
Limited Available Display Area**

Inventor(s):
Scott R. Shell
Kevin Timothy Shields

ATTORNEY'S DOCKET NO. MS1-161US

1 **TECHNICAL FIELD**

2 This invention relates hypermedia content browsers such as World Wide
3 Web browsers.

4 **BACKGROUND OF THE INVENTION**

5 “Hypermedia” is a metaphor for presenting information in which text,
6 images, sounds, and actions become linked together in a complex, non-sequential
7 web of associations that permit a user to browse through related content and topics,
8 regardless of the presented order of the topics. The term “hypermedia” arises from
9 the similar term “hypertext,” which was originally coined to describe the linked
10 text-based documents.

11 Hypermedia content is widely used for navigation and information
12 dissemination on the “World-Wide Web” (WWW or Web) of the Internet. An
13 application program referred to as a hypermedia browser, hypertext browser, “Web
14 browser” is normally used to retrieve and render hypermedia content from the
15 WWW, although such a browser is also useful for browsing hyperlinked content
16 from other sources.

17 Hypermedia content is commonly organized as documents with embedded
18 control information. The embedded control information includes formatting
19 specifications, indicating how a document is to be rendered by the Web browser.
20 In addition, such control information can include links or “hyperlinks”: symbols or
21 instructions telling the Web browser where to find other related WWW documents.
22 A hyperlink from one hypermedia topic to another is normally established by the
23 author of a hypermedia document, although some applications allow users to insert
24 hyperlinks to desired topics.

1 A hyperlink is typically rendered by a Web browser as a graphical icon or
2 as highlighted keywords. A user "activates" or "follows" a hyperlink by clicking
3 on or otherwise selecting the icon or highlighted keywords. Activating a link
4 causes the Web browser to load and render the document or resource that is
5 targeted by the hyperlink.

6 Hyperlink usage is not limited to the Internet. Various multimedia
7 applications and other hypermedia resources utilize hypertext to allow users to
8 navigate through different pieces of information content. For instance, an
9 encyclopedia program might use hyperlinks to provide cross-references to related
10 articles within an electronic encyclopedia. The same program might also use
11 hyperlinks to specify remote information resources such as WWW documents.

12 Hypermedia browsers have evolved in recent years and are available from
13 several sources. Microsoft's Internet Explorer is one example of a popular
14 browser that is particularly suitable for browsing the WWW and other similar
15 network resources. Browsers such as the Internet Explorer typically have a
16 content viewing area or window, in which textual or other graphical content is
17 displayed. Browser controls such as menus, status displays, and tool icons are
18 located in areas or windows adjacent the viewing area, so that they do not obstruct
19 or interfere with the viewing area.

20 One persistent characteristic of WWW browsing is that significant delays
21 are often encountered when loading documents and other multimedia content.
22 From the user's perspective, such delays can be quite frustrating. In severe cases
23 involving long delays, users might be inclined to believe that their browsers have
24 become inoperative. To avoid this situation, browsers typically include some type
25 of status display indicating progress in loading content. In many browsers, this

1 consists of a stationary icon such as a flag or globe that becomes animated during
2 periods when content is being loaded. For instance, such an icon might comprise a
3 flag that is normally stationary but that flutters or waves during content loading.
4 An icon such as this is positioned in a tool area or status area outside of the content
5 viewing area. The icon is visible at all times, but is animated only when content is
6 being loaded.

7 One very recent development relating to this subject is the emergence of a
8 number of popular, small, handheld computing devices that potentially support
9 Internet browsing. These include palmtops, pocket computers, personal digital
10 assistants, personal organizers, and the like. In this disclosure, this class of
11 computing devices is generally referred to as "handheld personal computers",
12 "handheld PCs", or "H/PCs".

13 One of the most desirable characteristics of H/PCs is their portability. The
14 compact, portable H/PCs provide a user with real computer-like applications—
15 such as email, PIM (personal information management), spreadsheet, and word
16 processing. Hypermedia browsers are among the application programs available
17 for H/PCs. A traveling user can receive email messages, schedule meetings or
18 appointments, and browse the Internet from the H/PC.

19 To keep H/PCs small, compromises are of course necessary. Chief among
20 the design compromises is an undersized display. Screen space is very limited.
21 Traditional user interface techniques which users are accustomed to on desktop
22 computers are not available for H/PC displays due to the limited size.
23 Additionally, the screen must be efficiently utilized to enable effective data input
24 from the stylus.

25

1 With a hypermedia or Internet browser, in particular, there may not be room
2 enough on the available display to implement an animated status display such as
3 described above.

4 The inventors, however, have developed a method of implementing a status
5 display even within the limited display areas available on popular H/PCs.

6

7 **SUMMARY OF THE INVENTION**

8 In accordance with the invention, a browser has a content viewing area that
9 is used for displaying graphical hypermedia content. A temporary, animated
10 graphic element is presented in a corner of the content viewing area during times
11 when the browser is loading content. The graphic element is not displayed during
12 any other times.

13

14 **BRIEF DESCRIPTION OF THE DRAWINGS**

15 The same reference numbers are used throughout the drawings to reference
16 like components and features.

17 Fig. 1 is a perspective view of a handheld computing device in an open
18 position.

19 Fig. 2 is a block diagram of the handheld computing device.

20 Figs. 3 and 4 are illustrations of displays generated by a hypermedia
21 browser in accordance with the invention.

22

23 **DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT**

24 Fig. 1 shows a handheld computing device 20. As used herein, "handheld
25 computing device" means a small computing device having a processing unit that

1 is capable of running one or more application programs, a display, and an input
2 mechanism such as a keypad, a touch-sensitive screen, a track ball, a touch-
3 sensitive pad, a miniaturized QWERTY keyboard, or the like.

4 The handheld computing device 20 is embodied as a handheld personal
5 computer. The terms "handheld computing device" and "handheld personal
6 computer" (or handheld PC or H/PC) are used interchangeably throughout this
7 disclosure. However, in other implementations, the handheld computing device
8 may be implemented as a personal digital assistant (PDA), a personal organizer, a
9 palmtop computer, a computerized notepad, or the like. The invention can also be
10 implemented in other types of computers and computer-like or computer-
11 controlled devices having graphical display surfaces.

12 Handheld computing device 20 has a casing 22 with a cover or lid 24 and a
13 base 26. A liquid crystal display (LCD) 28 with a touch-sensitive screen is
14 mounted to lid 24. Lid 24 is hinged to base 26 to pivot between an open position,
15 which exposes display 28, and a closed position, which protects the display. The
16 device is equipped with a stylus 30 to enter data through touchscreen display 28
17 and a miniature QWERTY keyboard 32. Stylus 30 and keyboard 32 are both
18 mounted in base 26. Although the illustrated implementation shows a two-
19 member H/PC 20 with a lid 24 and a base 26, other implementations of the H/PC
20 might comprise an integrated body without hinged components, as is the case with
21 computerized notepads (e.g., Newton® from Apple Computers).

22 Fig. 2 shows functional components of the handheld computing device. It
23 has a processor 40, a computer-readable storage medium or memory 42, a display
24 28, and a keyboard 32. Memory 42 generally includes both volatile memory (e.g.,
25 RAM) and non-volatile memory (e.g., ROM, PCMCIA cards, etc.). The H/PC 20

1 has a power supply 46 that supplies power to the electronic components. The
2 power supply 46 is preferably implemented as one or more batteries. The power
3 supply 46 might further represent an external power source that overrides or
4 recharges the built-in batteries, such as an AC adapter or a powered docking
5 cradle.

6 An operating system program 44 is resident in the memory 42 and executes
7 on the processor 40. The operating system 44 is a multitasking operating system
8 that allows simultaneous execution of multiple applications. The operating system
9 employs a graphical user interface windowing environment that presents
10 applications and documents in specially delineated areas of the display screen
11 called "windows." Each window can act independently, including its own menu,
12 toolbar, pointers, and other controls, as if it were a virtual display device. The
13 handheld computing device may be implemented with other types of operating
14 systems that support a graphical user interface.

15 The operating system 44 is preferably the Windows® CE operating system
16 from Microsoft Corporation that is configured to execute application programs
17 such as application program 48 shown in Fig. 2. The Windows® CE operating
18 system is a derivative of Windows® brand operating systems, such as Windows®
19 95, that is especially designed for handheld computing devices having limited
20 display areas.

21 In the described embodiment of the invention, application program 48 is an
22 Internet or other hypermedia browser. The browser is stored as a sequence of
23 program instructions in memory 42, for execution by processor 40. In other
24 embodiments, the browser might be stored on a portable or removable type of
25 computer-readable storage medium such as a floppy disk or EPROM (eraseable

1 read-only memory). As used here, the term "hypermedia browser" refers to an
2 application or application program that is capable of displaying or otherwise
3 rendering hypermedia content and of loading additional or alternative hypermedia
4 content in response to a user's selection of hyperlinks.

5 Browser 48 has access to a hypermedia resource 49. Often, this resource
6 will be the Internet. However, other sources of hyperlinked content are frequently
7 available and can be efficiently browsed in accordance with the invention.
8 Computer 20 includes a network interface or modem (not shown) for accessing the
9 hypermedia resource.

10 Fig. 3 shows an example of a graphical display 50 generated by a
11 hypermedia browser 48 in conjunction with operating system 44. The display
12 includes a number of elements that are generated by making appropriate system
13 calls to the operating system in accordance with well-known protocols.
14 Specifically, Windows® CE supports a subset of the Win32 API set used in the
15 Windows® 95 operating system. These APIs allow an application program to
16 create a variety of on-screen controls with minimal effort.

17 In this case, the graphical display 50 includes a taskbar 52 presented by the
18 Windows® CE operating system. Browser 48 presents a main window 54, above
19 taskbar 52. Browser main window 54 in this example has three primary
20 components. The largest screen area is dedicated to a content viewing area 56.
21 This is the area in which graphical hypermedia content is displayed.

22 Content viewing area 56 is bordered along its upper edge by a toolbar 58.
23 Toolbar 58 is similar in appearance to toolbars used in other application programs
24 designed for the Windows® operating environment, with some characteristics that
25 are unique to the Windows® CE environment. One characteristic that is unique to

1 Windows® CE is that the toolbar includes both a menu area 59 and an icon area
2 60. In previous versions of Windows®, these features were presented within their
3 own distinct areas. Another Windows® CE characteristic is that the toolbar is
4 located on what would have been the “title bar” of previous Windows®
5 application programs. The toolbar thus includes an “X” icon 61 that is used to
6 close the browser application. In previous versions of Windows®, the toolbar
7 would have been below or otherwise separate from the title bar.

8 A scroll bar 62 borders content viewing area 56 along its right side. Scroll
9 bar 62 is used to vertically scroll the content that is presented in content viewing
10 area 56.

11 In contrast to prior art hypermedia browsers, browser 48 does not include a
12 permanent “loading status” icon. In fact, no portion of main window 54 is
13 dedicated permanently to displaying loading status. Rather, the browser is
14 configured to display a temporary graphic element 64 over content viewing area 56
15 during times when the browser is loading content. This temporary graphic element
16 is preferably animated (such as the waving Microsoft® flag shown), and is
17 displayed only when the browser is loading content. It is removed when the
18 browser is not loading content. Fig. 4 shows display 50 after content has been
19 loaded, during a period when no additional content is being loaded. Graphic
20 element 64 has been removed in Fig. 4 because the current Internet page has been
21 completely loaded.

22 The temporary graphic element is preferably located in a corner of the
23 content viewing area, and obstructs a portion of the viewing area. The upper right
24 corner is preferred because this position is often blank in Internet documents. The
25

1 graphic element is created by opening a conventional window in conjunction with
2 the Window® CE windowing operating environment.

3 This method of displaying loading status achieves the objective of alerting
4 users during periods of time when content is actually being loaded. It does this
5 without requiring a permanent allocation of screen real estate, thus freeing space
6 for other functions. Although there might be some obstruction of hypermedia
7 content, such obstruction is minor and temporary.

8 The invention has been described primarily in terms of its visual and
9 functional characteristics. However, the invention also includes a method of
10 browsing a hyperlink resource such as the Internet or some other network or data
11 source having linked hypermedia content. The method includes a ~~steps~~ of loading
12 content from the hyperlink resource in response to user selection of hyperlinks
13 contained in said content, and of displaying the content in a content viewing area.
14 The invention also includes a step of displaying a temporary graphic element over
15 the content viewing area during the loading step. The temporary graphic element
16 is removed when content is no longer being loaded.

17 Although the invention has been described in language specific to structural
18 features and/or methodological steps, it is to be understood that the invention
19 defined in the appended claims is not necessarily limited to the specific features or
20 steps described. Rather, the specific features and steps are disclosed as preferred
21 forms of implementing the claimed invention.